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(54) Title: A METHOD FOR TRANSMITTING DATA BETWEEN A USER UNIT AND A COMPUTER RESOURCE, WHERE THE COMMUNICATION MODE IS BASED ON WHICH PART OF A POSITION-CODING PATTERN THAT HAS BEEN DETECTED

(57) Abstract: The invention relates to a method of effecting in a computer system transmission of data between a digital user unit and a computer resource, the user unit being adapted to detect positions on a base which is provided with a part of a global position-coding pattern. The invention is characterized in that a request for access to a computer resource is received, using a first protocol stack, by the computer system from the user unit, said request containing a position indication, relating to which part of the global position-coding pattern that has been detected by the user unit. The computer system gains access to a computer resource using a communication mode and a second protocol stack. The communication mode is chosen based on the position indication. Only the second protocol stack comprises TCP/IP functionality, so that only data transmitted between the computer system and the computer resource comprises routing information.

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A METHOD FOR TRANSMITTING DATA BETWEEN A USER UNIT AND A COMPUTER
RESOURCE, WHERE THE COMMUNICATION MODE IS BASED ON WHICH PART OF
A POSITION-CODING PATTERN THAT HAS BEEN DETECTED

Field of the Invention

The invention relates to a method of effecting in a
computer system transmission of data between a user unit
and a computer resource according to the preamble to
5   claim 1, 13 or 14, a computer program according to the
preamble to claim 17, a memory medium according to claim
18, a propagating signal according to claim 19 and a sys-
tem according to the preamble to claim 20.

10   Background Art

The present invention is intended for use in connec-
tion with digital user units, preferably in the form of
digital pens, which are capable of detecting positions on
the basis of a position-coding pattern. If a user writes
15   with such a pen on a base which is provided with the cor-
rect type of position-coding pattern, a sequence of posi-
tions is recorded, which constitutes a "digital copy" of
the handwritten information written on the base.

Such a digital device can, by means of a short range
20   radio link (such as a BLUETOOTH link), communicate with
a computer system, for instance a personal computer (PC).
This enables storing in the computer system of "digital
copies" of the above type. Moreover such a connection al-
lows interaction between the digital device and applica-
25   tions in the computer system. In addition to storing
handwritten information, the user can by means of the
user unit activate other functionalities in such appli-
cations.

For example, the user can, by marking with the user
30   unit a certain area on a sheet of paper and thus detect-
ing certain predetermined positions, initiate a function
in an application in the computer system. Examples of
such functions can be to process previously recorded
handwritten information in a certain manner, send such

information to a certain recipient etc. Thus, this affords the attractive possibility of using the user unit and a position-coded sheet (pen and paper) as a user interface for an application in a computer system.

5 In this context, there is a pronounced interest in letting the user unit interact also with other applications than those operating in precisely the computer system with which the user unit is in direct connection. For instance, a payment transaction, which a user initiates

10 by filling in a position-coded form, may have to be recorded and checked in a central server unit belonging to a bank where the user is a customer.

There may thus be a need to establish connections between the user unit and computer resources, such as a

15 server connected to the same LAN (Local Area Network) as the computer system or a server connected to the Internet. This could be carried out by using the computer system (PC) as a link between the user unit and these computer resources.

20 A first conceivable approach of achieving this is to let the computer system function as a client in relation to the desired computer resources. In such cases, the computer system (PC) initiates all communication with the various computer resources. The user unit (pen) contri-

25 butes position information which causes client software in the computer system to act in a certain manner. In this case it may be said that the system acts "intelligently" since this is where position information is converted into functionality.

30 A drawback of such an approach is the difficulty of guaranteeing secrecy for the user who does not necessarily own and control the computer system (PC). For example, in safe transactions it is desirable to maintain transmitted information encrypted all the way between the

35 pen and the computer resource used. Such an approach also makes it difficult to use the user unit offline, i.e. without direct contact with the computer system, and

carry out recorded transactions on a later occasion when
a contact has been established.

A second conceivable approach is to let the user
unit function as a client and have the possibility of es-
tablishing on its own a packet switched connection with
the required computer resource. The user unit can then
on its own generate and receive data packets according
to the TCP/IP protocols, which packets are only transmit-
ted by the computer system to which the user unit is con-
nected.

For a plurality of technical reasons, this second
approach is difficult to accomplish. In most operating
systems for personal computers, it is difficult to handle
a plurality of TCP/IP transactions at the same time.
Moreover it is complicated to allocate a (required) IP
address from the computer system to the user unit. It may
also be the case that the computer system acts behind a
firewall and has proxy settings which are difficult for
the user unit to access and without which no connection
can be established. Similarly, it is difficult for the
user unit to carry out DNS (Domain Name System) calls.

Summary of the Invention

An object of the present invention is to wholly
or partly eliminate the above problems. This object is
achieved by a method according to claim 1, 13 or 14 a
computer program according to claim 17, a memory medium
according to claim 18, a propagating signal according to
claim 19 and a system according to claim 20.

According to a first aspect, the invention relates
to a method of effecting in a computer system transmis-
sion of data between a digital user unit and a computer
resource, where the user unit is adapted to detect posi-
tions on a base which is provided with a part of a global
position-coding pattern. According to this aspect, the
method is characterized in that that a request for access
to a computer resource is received, using a first proto-

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col stack, by the computer system from the user unit,
said request containing a position indication relating to
which part of the global position-coding pattern that has
been detected by the user unit, and that the computer
5   system gains access to a computer resource using a
communication mode and a second protocol stack, wherein
the communication mode is chosen based on the position
indication, and wherein only the second protocol stack
comprises TCP/IP functionality, such that only data
10   transmitted between the computer system and the computer
resource comprises routing information.

     If such a method is used in the computer system,
the user unit may function as a client while at the same
time the computer system can adjust its communication
15   mode to which part of the position-coding pattern is
used. Different parts of the pattern imply that different
resources are to be called and in different ways. The
computer system establishes connections accordingly, but
the client functionality is retained in the user unit, so
20   that the connection can be used with maintained secrecy
between user unit and computer resource.

     Using TCP/IP functionality only in the second proto-
col stack results in simple and reliable communication
between user unit and computer system/PC.

25   Preferably, the first protocol stack may comprise an
HTTP-layer in connection with a layer emulating a serial
port, and the user unit may act in a client-server mode,
where the user unit constitutes the client and the com-
puter resource constitutes the server. Preferably also,
30   as the communication mode, a first communication mode may
be chosen if the position indication indicates that a
first part of the global position-coding pattern is util-
ized and a second communication mode may be chosen if the
position indication indicates that a second part of the
35   global position-coding pattern is utilized.

5

Preferably, the first communication mode comprises using a first set of protocol layers in the second protocol stack, and the second communication mode comprises using a second set of protocol layers in the second protocol stack. This enables dynamic use of protocol stacks depending on which part of the position-coding pattern is detected by the user unit.

Preferably, the second protocol stack in the second communication mode contains an additional protocol stack layer as compared with the second protocol stack used in the first communication mode. This entails more possibilities to adapt the communication mode in a manner that corresponds to the application for which it is used. Moreover, since the user unit normally will be battery operated, it may be advantageous to place energy consuming processes in the computer system.

Preferably, said request is an http request.

In a preferred embodiment, said indication comprises a URL. Such an embodiment can be easily implemented.

Alternatively, the indication can comprise one of the detected positions or a part thereof. This results in a more adaptive method.

In a preferred embodiment, the above additional protocol stack layer is a compression layer. This may be advantageous if the computer resource is reached via a narrowband communication channel, such as a mobile telephony system.

Alternatively, the additional protocol stack layer may be an encryption layer. This may be advantageous if the user unit itself cannot perform encryption, or if additional security measures are required.

In another preferred embodiment, the second communication mode is a point-to-multipoint communication mode. This allows the user unit to communicate with more than one computer resource simultaneously. This may provide, for instance, for backup functionality.

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A variation of the first aspect of the invention re-
lates to a method in a computer system of effecting
transmission of data between a digital user unit and a
computer resource, the user unit being adapted to detect
5   positions on a base which is provided with a part of a
global position-coding pattern, wherein a request for ac-
cess to a computer resource is received by the computer
system, said request containing a position indication re-
lating to which part of the global position-coding pat-
10   tern that has been detected by the user unit, and that
the computer system, if the position indication relates
to a predetermined part of the global position-coding
pattern, gains access to a computer resource which corre-
sponds to another user unit. This allows the e.g. PC to
15   make possible also communication between user units.

Another variation of the first aspect relates to a
method in a computer system of effecting transmission of
data between a digital user unit and a computer resource,
wherein the computer system communicates, using a first
20   protocol stack, with the user unit and communicates with
the computer resource using a second protocol stack,
wherein only the second protocol stack comprises TCP/IP
functionality, such that only data transmitted between
the computer system and the computer resource comprises
25   routing information.

Preferably, the user unit acts in a client-server
mode, where the user unit constitutes the client and the
computer resource constitutes the server.

Preferably, the computer resource is a remote
30   server, and the computer system communicates with the
user unit via a serial port or a radio interface which
emulates a serial port.

This makes possible simple and reliable communica-
tion between a user unit and remote computer resource,
35   and enables the user unit to act as a client in a client-
server configuration without supporting TCP/IP-func-
tionality.

According to a second aspect, the invention relates
to a computer program for effecting in a computer system
transmission of data between a digital user unit and a
computer resource, the user unit being adapted to detect

5   positions on a base which is provided with part of a
global position-coding pattern. The invention is then
characterized by instructions corresponding to the steps
that a request for access to a computer resource is re-
ceived, using a first protocol stack, by the computer

10   system from the user unit, said request containing a
position indication relating to which part of the global
position-coding pattern that has been detected by the
user unit, and that the computer system gains access to
a computer resource using a communication mode and a sec-

15   ond protocol stack, wherein the communication mode is
chosen based on the position indication, and wherein only
the second protocol stack comprises TCP/IP functionality,
such that only data transmitted between the computer sys-
tem and the computer resource comprises routing informa-

20   tion.
       Such a program can be stored on a digital memory me-
dium or sent as a propagating signal, gives advantages
corresponding to the above method, and may be varied
similarly.

25   According to a third aspect, the invention relates
to a system comprising a digital user unit, a computer
resource adapted to communicate with the user unit, and
a computer system for effecting transmission of data be-
tween the user unit and the computer resource, in which

30   the user unit is adapted to detect positions on a base
which is provided with part of a global position-coding
pattern. The system is characterized in that the user
unit comprises means for transferring, using a first pro-
tocol stack, a request for access to a computer resource

35   to the computer system, that said request comprises a po-
sition indication relating to which part of the global
position-coding pattern that has been detected by the

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user unit, and that the computer system comprises means for gaining access to a computer resource using a communication mode and a second protocol stack, wherein the communication mode is position indication dependent and only the second protocol stack comprises TCP/IP functionality.

This system gives advantages corresponding to the above method and may be varied similarly.

Brief Description of the Drawings

Fig. 1a shows an example of a system in which a method according to the present invention can be utilized.

Fig. 1b illustrates blocks in the computer system in Fig. 1a.

Fig. 2 illustrates the concept of protocol stack.

Fig. 3 illustrates a connection and a communication mode according to an embodiment of the present invention.

Fig. 4 shows a first example of an alternative communication mode in a computer system.

Fig. 5 shows a second example of an alternative communication mode in a computer system.

Fig. 6 shows a third example of an alternative communication mode in a computer system.

Fig. 7 shows a fourth example of an alternative communication mode in a computer system.

Fig. 8 shows a flow chart illustrating a method according to the invention.

Description of Preferred Embodiments

Fig. 1a shows an example of a system in which a method according to the present invention can be utilized. The Figure shows a user unit 101 in the form of a digital pen of the type as disclosed in WO 01/26033, which is incorporated herewith by reference. The pen 101 is used for writing on a sheet of paper 102, which is provided with a position-coding pattern 103 (enlarged).

This pattern 103 has the property that if a certain mini-
mum part of the pattern 103 is recorded optically by
means of an image sensor in the pen 101, the position of
this part and, thus, the pen 101 in the total pattern can

5   be detected. When writing using the pen 101, a sequence
of absolute positions.is thus recorded, which constitutes
a digital copy of what is being written on the sheet 102.
The present invention relates to a method of making a
connection of such a user unit 101, or a similar type of

10   user unit, to a computer resource, preferably in the form
of a server unit 104 which is connected to a network. The
connection can be established, for example, via the
Internet 105. According to the present invention, use
is made of a computer system, such as a personal computer

15   100, communicating with the user unit and also communi-
cating with the server unit 104, via one or more net-
works, to establish connection for the portable, digital
user unit. The user unit 101 and the computer system 100
can communicate by means of a short range radio link (cf.

20   BLUETOOTH) or with an IR link, cable or the like. Thus
the computer system is a link between the user unit and
the computer resource.

According to a preferred embodiment of the inven-
tion, the user unit 101 includes a client functionality,

25   such as http client software. Such software can initiate
a client-server connection with a server unit. In such
cases, the http client generates an http request. Such
a request contains a URL which defines which server is
to be contacted.

30   A position-coding pattern of the type disclosed
in Applicant's Application WO 01/26033, which is herewith
incorporated by reference, is capable of coding with
great accuracy an area in the order of 4.6 million square
kilometres, which corresponds to enormous amounts of A4

35   pages. This total surface can for instance be hierarchi-
cally divided, for example into a number of "segments"
which in turn are divided into a number of "shelves".

Each shelf may contain a number of "books", and each book a number of pages. A detected position in the position-coding pattern can be located to a certain page, which can be identified with the format

1.2.3.4 (segment=1.shelf=2.book=3.page=4), i.e. similarly to an IPv4 address, but without the same value restrictions.

It is to be noted that this relates to the abstract, global pattern. Of course, a physical sheet of paper can be printed piece by piece with fully separated, selected parts of this global pattern, i.e. with parts of different "abstract" pages.

Fig. 1b shows blocks in the computer system 100 in Fig. 1a. There is shown an interface 107 with driver and adapter for the user unit 101, which interface makes the transmission method, used for user unit-computer system transmissions, transparent to the other parts of the computer system. The computer system 100 according to an embodiment of the invention further comprises a functional module designated "SWITCH" 108, which serves to enable position-indication-dependent communication between the user unit 101 and computer resources, such as remote servers 104, 104' and local applications 109, as will be described below.

The computer system 100 in fig 1b may be used in different scenarios. There is a possibility of reserving certain partial areas in the global pattern for specific applications or for specific users, as disclosed in Applicant's Application WO 01/48685, which is incorporated herewith by reference. For example, all pages in a certain book on a certain shelf in a certain segment can be reserved for the user "A". These pages can preferably be given certain properties, as desired by the user. The same applies to partial areas within the pages and individual positions on the pages. The properties may include rules as to how information, which is filled in, using a

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user unit 101, on physical sheets, provided with this
part of the pattern, is to be interpreted.

When a user, for instance by marking an activation
icon 106, begins to use a sheet of paper 102 which has
5   been printed with this reserved part of the global pat-
tern, the properties of this part of the pattern are not
necessarily known to the user unit 102.

In a first scenario, these properties can be re-
quested from a remote PLS server (PLS=Pattern Lookup Ser-
10   vice). The PLS server may then optionally also charge us-
ers for the utilization of the sheet/pattern. Such a
server can be global (GPLS), i.e. intended for all users
of the global position-coding pattern, or local, i.e. in-
tended for a small group of users.

15   In a second scenario, the PLS "server" may be en-
tirely local (LPLS), which means that it is contained in
the computer system 100. The local LPLS serves to direct
requests and information from the user unit to various
applications operating in the computer system (PC).

20   In the first scenario, a GPLS 104 can, in response
to a request from a client, supply to the client, i.e.
the user unit 101, an address to an application service
handler (ASH) 104' which can function as a server in a
certain part of the pattern. The user unit 101 then com-
25   municates with the ASH 104' for performing desired func-
tions.

In the second local scenario, where the computer
system receives a "local URL", i.e. where the user unit
sends a request to a local application operating in the
30   computer system, a database 110 included in the LPLS may
supply address instructions to a local router 111 includ-
ed, which transmits data from the user unit to the cor-
rect local application (appl.) 109 in the computer system
100. Then communication occurs between the user unit 101
35   and the application 109. A requested computer resource
may thus relate to an external server, for instance GPLS
or ASH, an LPLS or some other local application in the

computer system. It should be noted that the term "user unit" may essentially also relate to a process in the computer system, i.e. a virtual user unit.

The user unit 101 can, depending on which part of the pattern has been detected, select the PLS server which is to be contacted. Thus the user unit 101 can initiate a pattern-dependent communication.

According to the present invention, also communication modes can be changed in the computer system 100 (for instance a PC), via which communication takes place, depending on which partial area of the global position-coding pattern has been detected by the user unit 101.

Such a partial area can relate to, for example, a certain segment or a certain shelf in a certain segment. It does not have to involve a contiguous area. It may involve, for example, certain pages in all books on a certain shelf in a certain segment.

The module 108 in the computer system 100 which enables this pattern-area-dependent communication can be designated proxy or switching unit.

Fig. 2 illustrates the term "protocol stack". The figure shows protocol stacks for two devices 201, 202 communicating with each other, according to the OSI (Open Systems Interconnection) model that is well known to those skilled in the art. This model is used to describe the function of a communication system. In the original OSI model, seven different layers were defined, numbered from below and up. However, in most cases the model is shown with a smaller number of separate layers. In the lowermost layer, it is defined how the communication proceeds physically (for instance which voltage levels represent "1" and "0" in transmission by wire) for a non-structured bit stream which is transferred via a medium. In layers higher up in the model, more comprehensive functionalities are defined, such as synchronizing, setting up and terminating connections, and error control etc. The higher layers relate to definitions of the ap-

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plication that effects the communication, for instance
browser software in a personal computer.

The amount of data that is to be sent by an applica-
tion (high up in the model) in a first device, such as a
5   computer system, can in general terms be called payload.
When such data is to be transmitted, it is moved down in
the model, whereby the functionalities in the different
layers to a varying degree add what is referred to as
overhead, i.e. data which in a layer is added to the data
10   set coming from above, so as to allow the functions that
are provided in the layer. For instance, a payload data
stream may be divided into packets, each of which is pro-
vided with a header, to be used in forwarding the packet.
In the lowermost layer, the two devices communicate with
15   each other and there the data is transferred. The data
received in the second device 202 is moved upwards in
this protocol stack until it is received by the corre-
sponding application in the second device.

It may be generally said that a given layer in the
20   protocol stack of the model makes the layers below trans-
parent to the layers above. For two devices to communi-
cate with each other, it is necessary for all layers in
their respective protocol stacks to conform in pairs.

Fig. 3 illustrates a connection according to an em-
25   bodiment of the present invention. The figure shows pro-
tocol stacks of a user unit, of a computer resource/
server, with which the user unit intends to communicate,
and of an intermediate computer system (PC), via which
the communication is intended to take place. Between the
30   PC and the user unit, the communication takes place ac-
cording to the BLUETOOTH standard and, more specifically,
according to the RFCOMM specification which emulates a
serial port. According a preferred embodiment of the in-
vention, the HTTP client is put directly over RFCOMM,
35   i.e. no TCP/IP layers are present in these protocol
stacks. Thus no routing information is used in this link,
which relates to a point to point connection. This mode

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of communication between user unit and computer system can be utilized also where the communication mode of the computer system is not dependent on the position-coding pattern.

5   For the communication between the PC and the server, use is made in the ordinary way of protocol stacks where an HTTP application is superimposed with a TCP (Transmission Control Protocol) layer which is superimposed with an IP (Internet Protocol) layer which is superimposed

10   with an NAP (Network Access Protocol) layer. The NAP layers in the server and the PC do not have to conform with each other if one or more routers (not shown) are placed between them.

Summing up, the function can be such that the user

15   unit generates an HTTP request which is to be transmitted to the server. The request is received by the PC which reads the URL in the request (for instance pls.anoto.com) and makes a DNS call to obtain the corresponding IP address. Then the PC generates TCP/IP packets (datagrams)

20   which contain the request as payload.

It is to be noted that the computer system for communication with the user unit utilizes a first protocol stack and for communication with the computer resource utilizes a second protocol stack. Only the second proto-

25   col stack contains TCP/IP functionality so that only data which is transmitted between the computer system and the computer resource contains routing information which is necessary according to the TCP/IP protocol.

The above application in the PC which handles the

30   communication can preferably be programmed as an HTTP proxy. Such a proxy functions as an application level gateway for a client.

According to an embodiment of the present invention, the application in the PC utilizes different com-

35   munication modes depending on which part of the global position-coding pattern the user unit has detected. For instance, different sets of protocol stacks may be used

for different parts of the pattern. For the PC to be able
to choose the communication mode depending on which part
of the pattern is indicated, a position indication must
be transmitted from the user unit to the PC.

5

TRANSMISSION OF POSITION INDICATION
     In its simplest embodiment, transmission of a posi-
tion indication takes place as follows. The user unit de-
tects a position in the global position-coding pattern.
10   The user unit interprets the position information in such
manner that a certain server with a certain URL is to be
contacted. This can be carried out, for example, by means
of a lookup table. Preferably, the HTTP client creates in
the user unit an HTTP request directed to the URL of the
15   server in question. This request is sent to the computer
system (PC) which reads the URL. Since this is dependent
on which partial area in the position-coding pattern has
been detected, such an indication has been transferred
to the PC. Thus the indication can be a URL. This is
20   the simplest way of transmitting a position indication
to the computer system. However the computer system is
not allowed to utilize a plurality of separate position-
dependent communication modes with one and the same
server since the position indication consists of the URL
25   thereof.
     According to an alternative embodiment therefore,
the position indication can be transferred separately,
for instance in the form of a position or part of a
position. A complete position can be created as "seg-
30   ment.shelf.book.page/x,y" (1.2.3.4/00556,10124) where x
and y define local coordinates within the page. In most
cases part of a position is sufficient, for instance
"segment.shelf"(1.2.*.*), which defines a large area. It
is also possible to transfer the indication "book"
35   (*.*.3.*) which defines a plurality of non-contiguous ar-
eas in the pattern.

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COMMUNICATION METHODS

A communication mode may also be called a communica-
tion method. An example of a communication mode is shown
in Fig. 3. Figs 4-6 now illustrate variants of
5   the communication modes of the computer system (PC)
which are selectable on the basis of which part of the
position-coding pattern has been detected.

Fig. 4 shows a first example of an alternative com-
munication mode in a computer system. Here, compared with
10   Fig. 3, a compression layer has been added. This has been
made because the computer system has received a position
indication which implies that compression is to take
place. In the example shown, JPEG compression of image
information is thus carried out. This image information
15   may be transferred from the user unit, resident on the
computer system (PC), or retrieved from any computer re-
source. Compression may be advantageous if data is to be
transferred via a narrowband channel, e.g. if data is to
be transmitted from the computer system to a computer re-
20   source via a mobile telephony system. Further,
compression algorithms are generally calculation inten-
sive and, thus, energy intensive. When the image informa-
tion originates from the user unit, it may therefore be
advantageous to perform such compression in the computer
25   system instead of in the usually battery operated user
unit.

Fig. 5 shows a second example of an alternative com-
munication mode in a computer system. Here simultaneous
communication with two separate computer resources takes
30   place. The user unit 101 then operates against a local
application in the computer system while at the same
time a global server records transactions performed. A
backup copy is then stored in an additional place. Like
in Fig. 4, this takes place if a certain area in the po-
35   sition-coding pattern has been detected. Thus, in this
case the received position indication indicates that the
computer system should in general communicate in a point

to multipoint fashion. The primary information sent to a
first computer resource is mirrored onto another computer
resource as secondary information. It should be noted
however that the second information need not be entirely
5   identical with the primary information.

For instance, if a user device operates vis-à-vis a
local application in a PC, the information which is sent
in requests to the local application will form the pri-
mary information. In a mirroring communication mode, sec-
10   ondary information corresponding to the primary informa-
tion may be sent for instance to a remote server, e.g.
for backup or billing purposes (e.g. for charging the
user for the use of a part of the global position-coding
paper that is connected to a specific service). The sec-
15   ondary information may, for instance, be compressed and
encrypted. Another option is to filter the secondary in-
formation in order to avoid that certain information
leaves the PC/computer system or in order only to mirror
e.g. billing-specific information.

20   Fig. 6 shows a third example of an alternative com-
munication mode in a computer system. Here, compared with
Fig. 3, an encryption layer has been added. This has been
made since the computer system has received a position
indication which implies that additional encryption is to
25   take place.

A further possibility of adjusting the communication
mode is, compared with Fig. 3, to remove layers from a
protocol stack. For example, the computer system may ar-
range a communication path between two user units, one
30   functioning as a server and the other as a client, as is
indicated in fig 7. Then the computer system may have two
protocol stacks such as the left protocol stack in the
computer system in Fig. 3. The first user unit (USER UNIT
1) acts as a client and the second user unit (USER UNIT
35   2) acts as a server. The client server relationship may
be switched during the communication. The first and sec-
ond user units communicate via a computer system (PC),

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and use protocol stacks where an HTTP-layer is in direct
contact with a layer emulating a serial port, such as an
RFCOMM-layer. In this case none of the protocol stacks
thus involve a TCP/IP-layer, since no network addressing
5   functionality is needed.

The communication modes of the computer system may
be varied also in other ways than changing the protocol
stacks. For example, the selection of port for different
types of communication may be adjusted depending on which
10   part of the position-coding pattern has been detected.

Fig. 8 shows a flow chart illustrating a method ac-
cording to the invention. The method is performed in a
computer system, such as a PC. In a first step a request
for access to a computer resource is received 801 from a
15   user unit, wherein the request contains a position indi-
cation relating to a position coding pattern. In a second
step a communication mode is chosen 802, based upon the
received position indication. The communication mode may
be chosen for instance by means of a lookup table, which
20   is stored either in the computer system itself or on a
remote server. In a third step the computer resource,
which was requested by the user unit, is accessed using
the chosen communication mode.

It should be noted that the feature with position
25   indication dependent communication modes could be used
with any protocol stack arrangement, i.e. also where
TCP/IP-layers are used between the user unit and the com-
puter system. Hence, in an embodiment, the invention re-
lates to a method of effecting in a computer system
30   transmission of data between a digital user unit and a
computer resource, where the user unit is adapted to de-
tect positions on a base which is provided with a part of
a global position-coding pattern, wherein the computer
system receives from the user unit a request for access
35   to a computer resource, wherein said request contains an
indication concerning which part of the global position-
coding pattern has been detected by the user unit,

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wherein the computer system gains access to a computer
resource while utilizing a first communication mode if
the indication indicates that a first part of the global
position-coding pattern has been detected, and wherein
5   the computer system gains access to a computer resource
while utilizing a second communication mode if the indi-
cation indicates that a second part of the global posi-
tion-coding pattern has been detected.

The invention is not restricted to the above de-
10   scribed embodiments. It may be varied within the scope of
the appended claims.

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CLAIMS

1. A method in a computer system of effecting trans-
mission of data between a digital user unit and a com-
5   puter resource, the user unit being adapted to detect po-
sitions on a base which is provided with a part of a
global position-coding pattern, c h a r a c t e r i z e d
in that a request for access to a computer resource is
received, using a first protocol stack, by the computer
10   system (801) from the user unit, said request containing
a position indication relating to which part of the
global position-coding pattern that has been detected by
the user unit, and that the computer system gains access
(803) to a computer resource using a communication mode
15   and a second protocol stack, wherein the communication
mode is chosen (802) based on the position indication,
and wherein only the second protocol stack comprises
TCP/IP functionality, so that only data transmitted be-
tween the computer system and the computer resource com-
20   prises routing information.

2. The method as claimed in claim 1, in which, the
first protocol stack comprises an HTTP-layer in connec-
tion with a layer emulating a serial port, and wherein
the user unit acts in a client-server mode, where the
25   user unit constitutes the client and the computer re-
source constitutes the server.

3. The method as claimed in claim 1 or 2, in which,
as the communication mode, a first communication mode is
chosen if the position indication indicates that a first
30   part of the global position-coding pattern is utilized
and a second communication mode is chosen if the position
indication indicates that a second part of the global po-
sition-coding pattern is utilized.

4. The method as claimed in claim 3, wherein the
35   first communication mode comprises utilizing a first set
of protocol layers in the second protocol stack and the

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second communication mode comprises utilizing a second set of protocol layers in the second protocol stack.

5. The method as claimed in claim 3 or 4, in which the second protocol stack in the second communication
5   mode contains an additional protocol stack layer as compared with the second protocol stack used in the first communication mode.

6. The method as claimed in any one of the preceding claims, in which said request is an HTTP request.
10   7. The method as claimed in any one of the preceding claims, in which said indication comprises a network address, such as a URL.

8. The method as claimed in any one of claims 1-6, in which said indication comprises one of said positions.
15   9. The method as claimed in any one of claims 1-6, in which said indication comprises a part of one of said positions.

10. The method as claimed in claim 5, in which the additional protocol stack layer is a compression layer.
20   11. The method as claimed in claim 5, in which the additional protocol stack layer is an encryption layer.

12. The method as claimed in any one of claims 3-11, in which the second communication mode is a point-to-multipoint communication mode.
25   13. A method in a computer system of effecting transmission of data between a digital user unit and a computer resource, the user unit being adapted to detect positions on a base which is provided with a part of a global position-coding pattern,   c h a r a c t e r i z e d
30   in that a request for access to a computer resource is received by the computer system, said request containing a position indication relating to which part of the global position-coding pattern that has been detected by the user unit, and that the computer system, if the posi-
35   tion indication relates to a predetermined part of the global position-coding pattern, gains access to

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a computer resource which corresponds to another user
unit.

   14. A method in a computer system of effecting
transmission of data between a digital user unit and a
5   computer resource, c h a r a c t e r i z e d in that the
computer system communicates, using a first protocol
stack, with the user unit, and communicates with the com-
puter resource using a second protocol stack, wherein
only the second protocol stack comprises TCP/IP func-
10   tionality, so that only data transmitted between the com-
puter system and the computer resource comprises routing
information.

   15. A method according to claim 14, wherein the user
unit acts in a client-server mode, where the user unit
15   constitutes the client and the computer resource consti-
tutes the server.

   16. A method according to claim 14 or 15, wherein
the computer resource is a remote server, and where the
computer system communicates with the user unit via a se-
20   rial port or a radio interface which emulates a serial
port.

   17. A computer program for effecting in a computer
system transmission of data between a digital user unit
and a computer resource, the user unit being adapted to
25   detect positions on a base which is provided with a part
of a global position-coding pattern, c h a r a c t e r -
i z e d by instructions corresponding to the steps that
a request for access to a computer resource is received,
using a first protocol stack, by the computer system from
30   the user unit, said request containing a position indica-
tion relating to which part of the global position-coding
pattern that has been detected by the user unit, and that
the computer system gains access to a computer resource
using a communication mode and a second protocol stack,
35   wherein the communication mode is chosen based on the po-
sition indication, and wherein only the second protocol
stack comprises TCP/IP functionality, so that only data

transmitted between the computer system and the computer
resource comprises routing information.

18. A digital memory medium comprising a computer
program according to claim 17.

5   19. A propagating signal comprising a computer pro-
gram according claim 17.

20. A system comprising a digital user unit, a com-
puter resource adapted to communicate with the user unit,
and a computer system for effecting transmission of data

10   between the user unit and the computer resource, in which
the user unit is adapted to detect positions on a base
which is provided with a part of a global position-coding
pattern, c h a r a c t e r i z e d in that the user unit
comprises means for transferring, using a first protocol

15   stack, a request for access to a computer resource to the
computer system, that said request comprises a position
indication relating to which part of the global position-
coding pattern that has been detected by the user unit,
and that the computer system comprises means for gaining

20   access to a computer resource using a communication mode
and a second protocol stack, wherein the communication
mode is position indication dependent and only the second
protocol stack comprises TCP/IP functionality.

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Fig. 1a

Fig. 1b

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Fig. 2

POSITION INDICATION
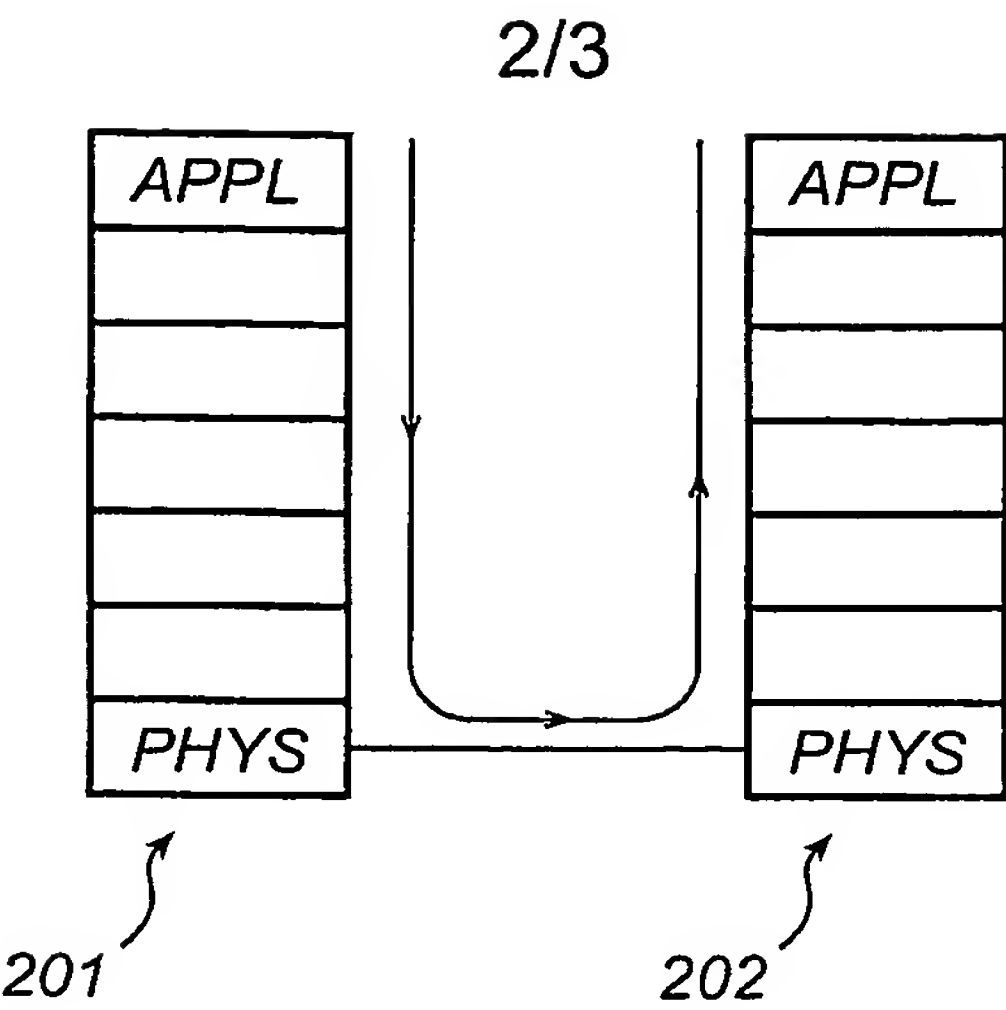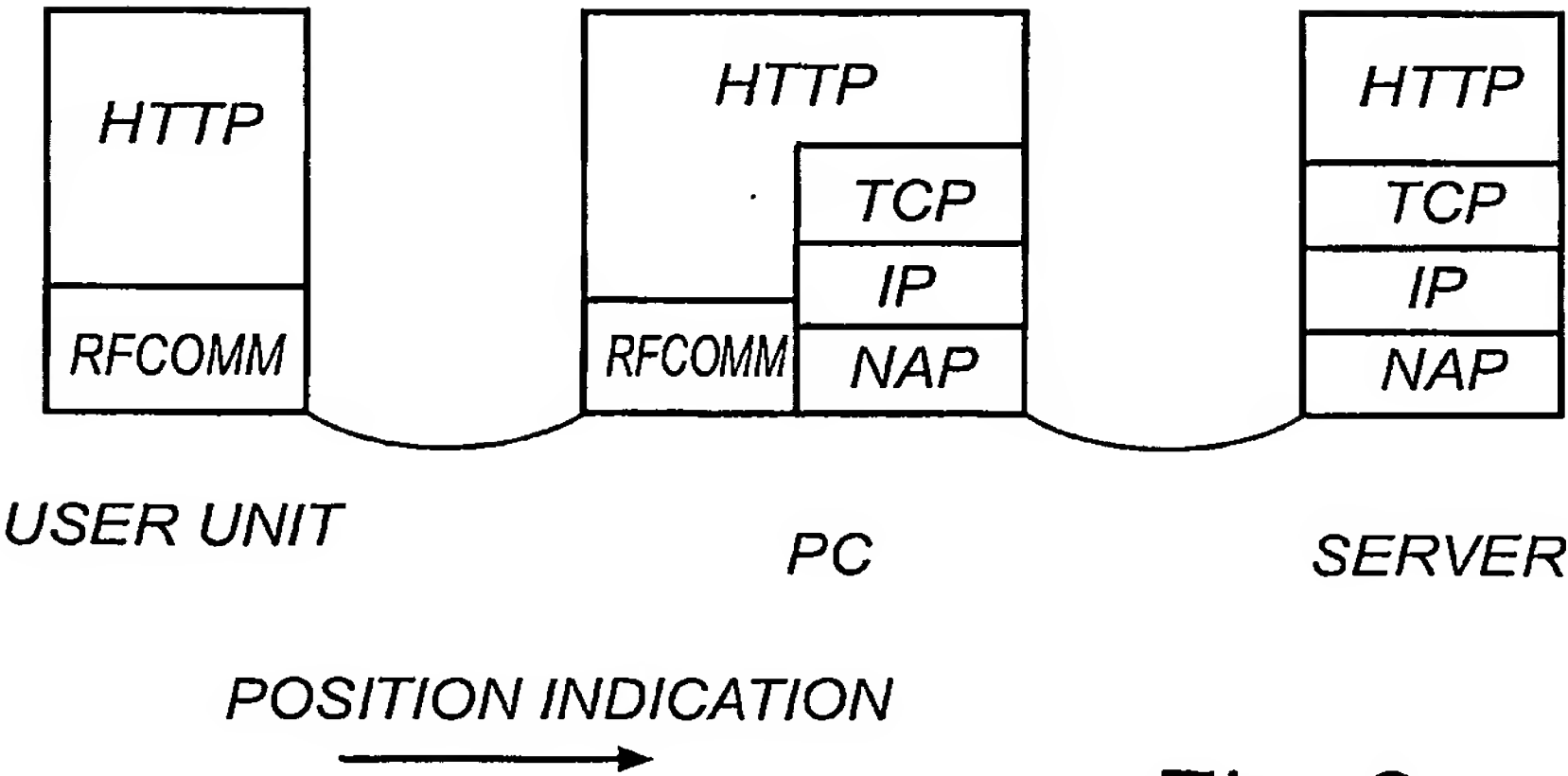
Fig. 3

Fig. 4

Fig. 5

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HTTP

	ENCRYPT
	TCP
	IP
RFCOMM	NAP

Fig. 6

| HTTP | HTTP | HTTP |
| RFCOMM | RFCOMM | RFCOMM | RFCOMM |

USER UNIT 1   PC   SERVER
                                      (USER UNIT 2)

Fig. 7

TRANSMISSION
METHOD

RECEIVE
REQUEST ⌇801

CHOOSE
COMMUNICATION ⌇802
MODE

ACCESS
COMPUTER ⌇803
RESOURCE
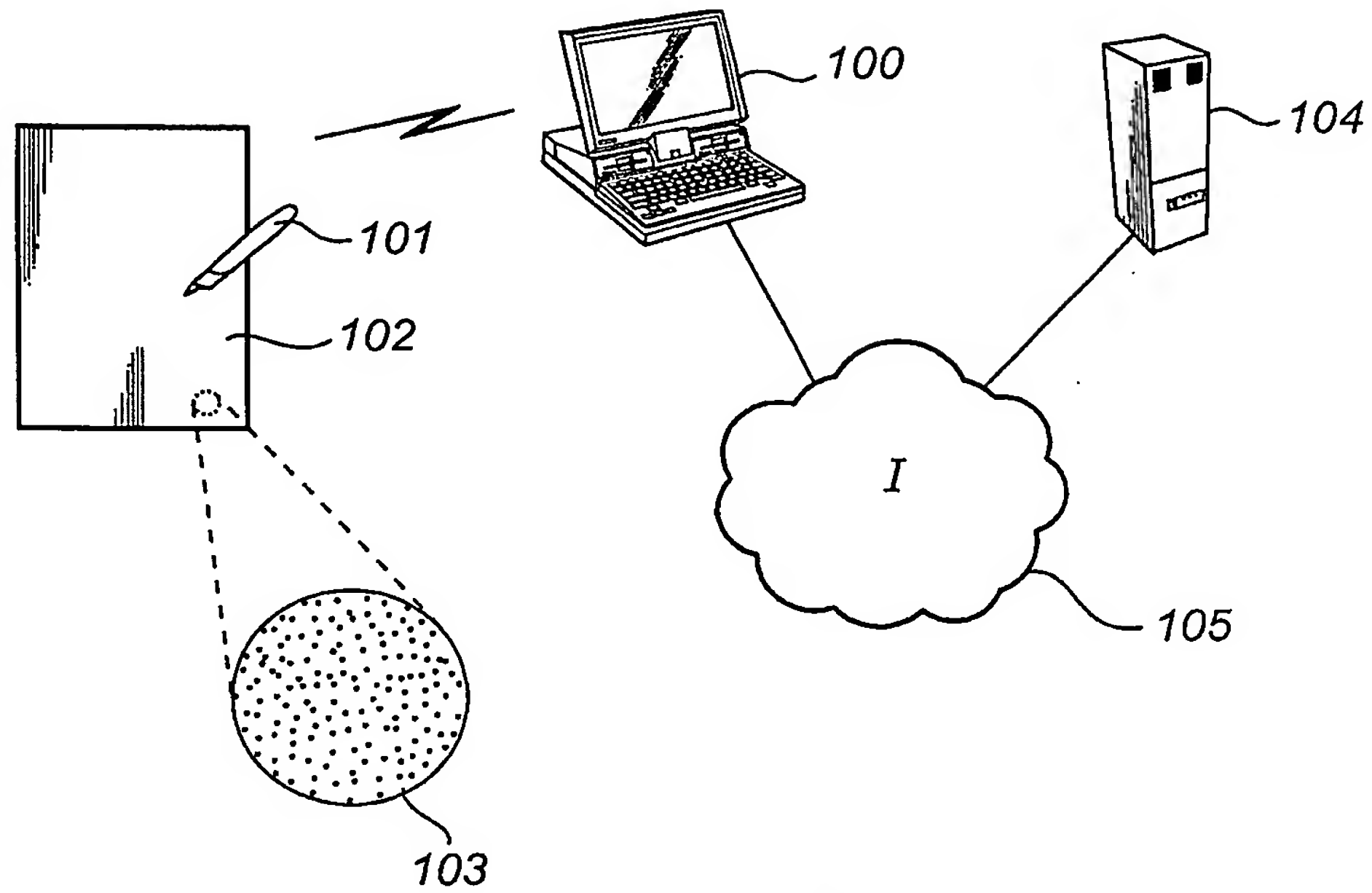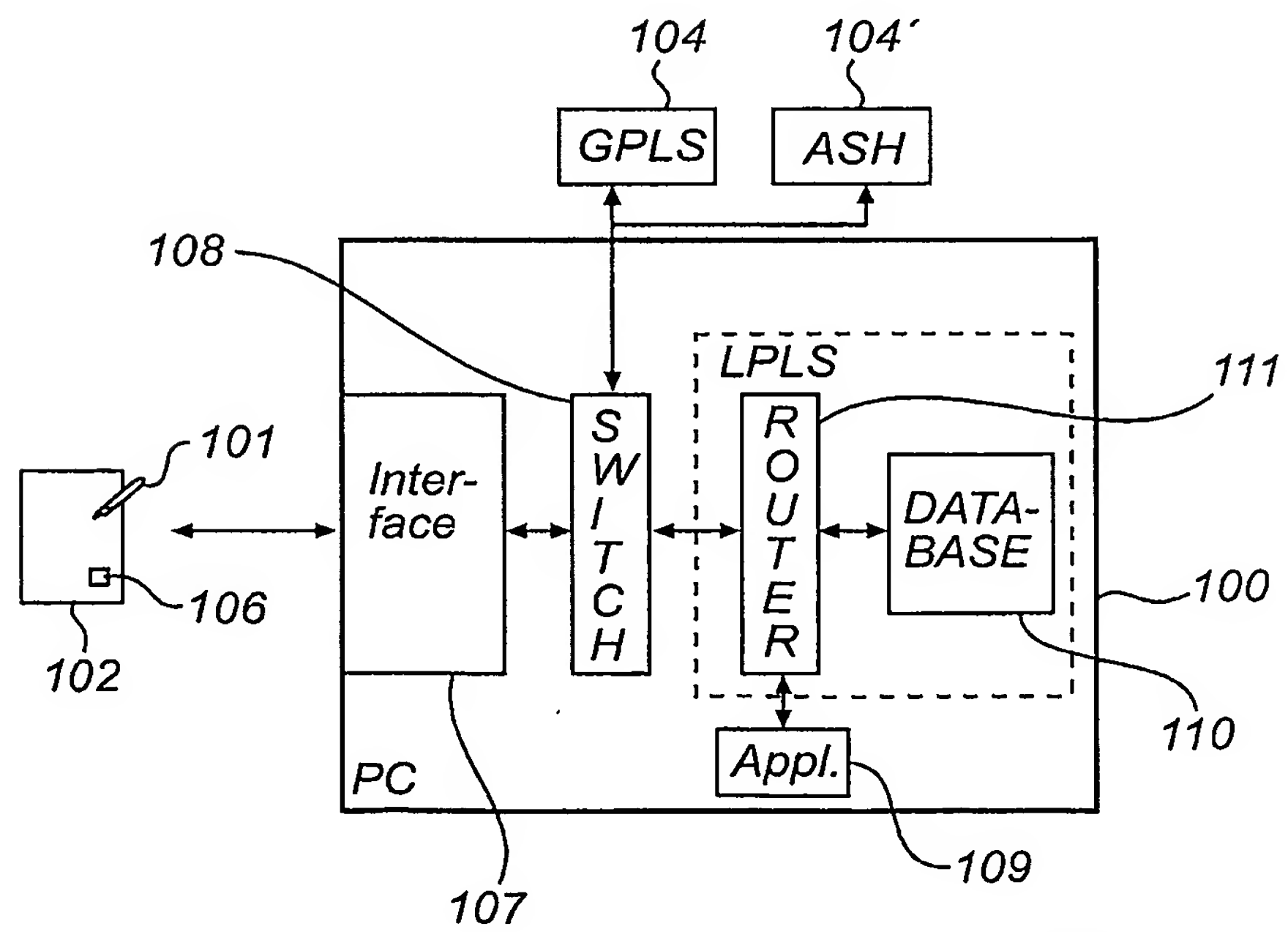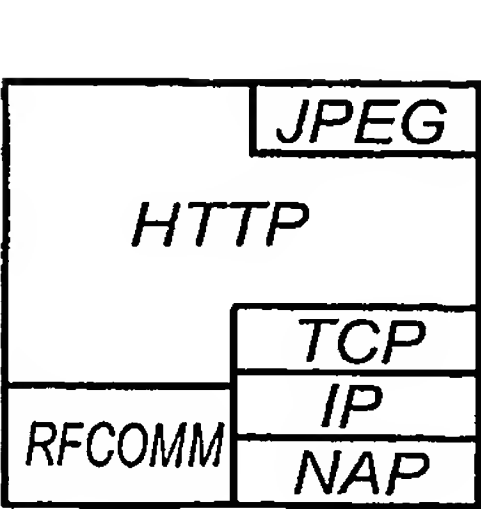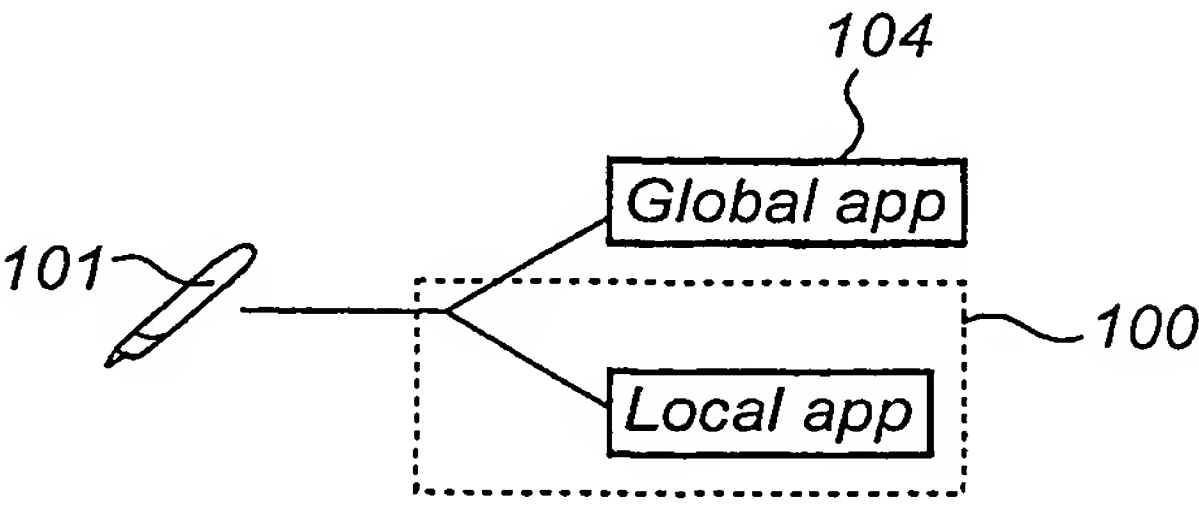
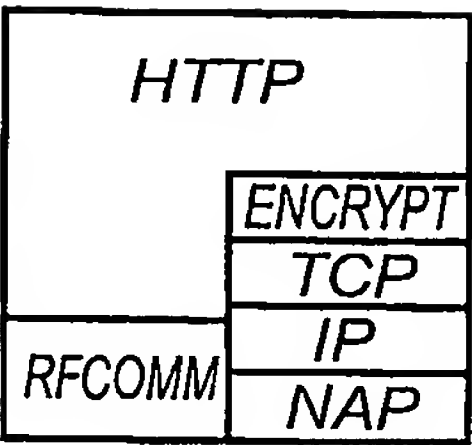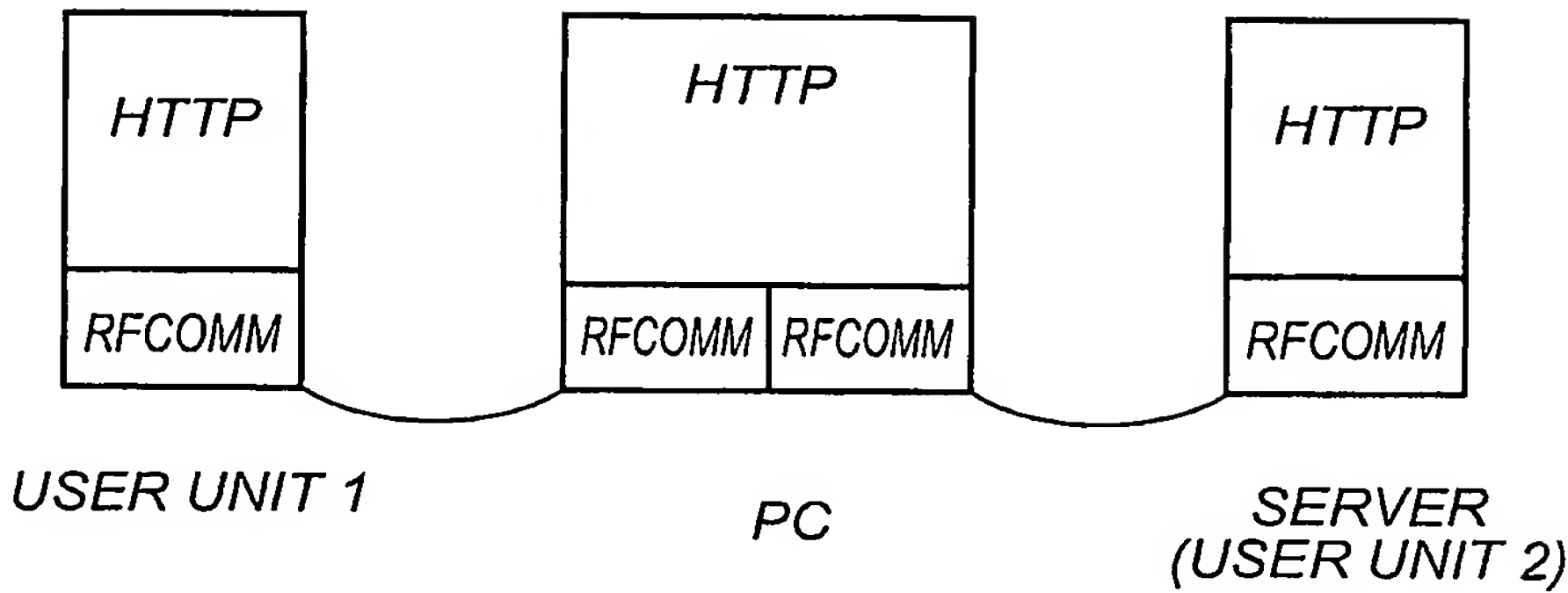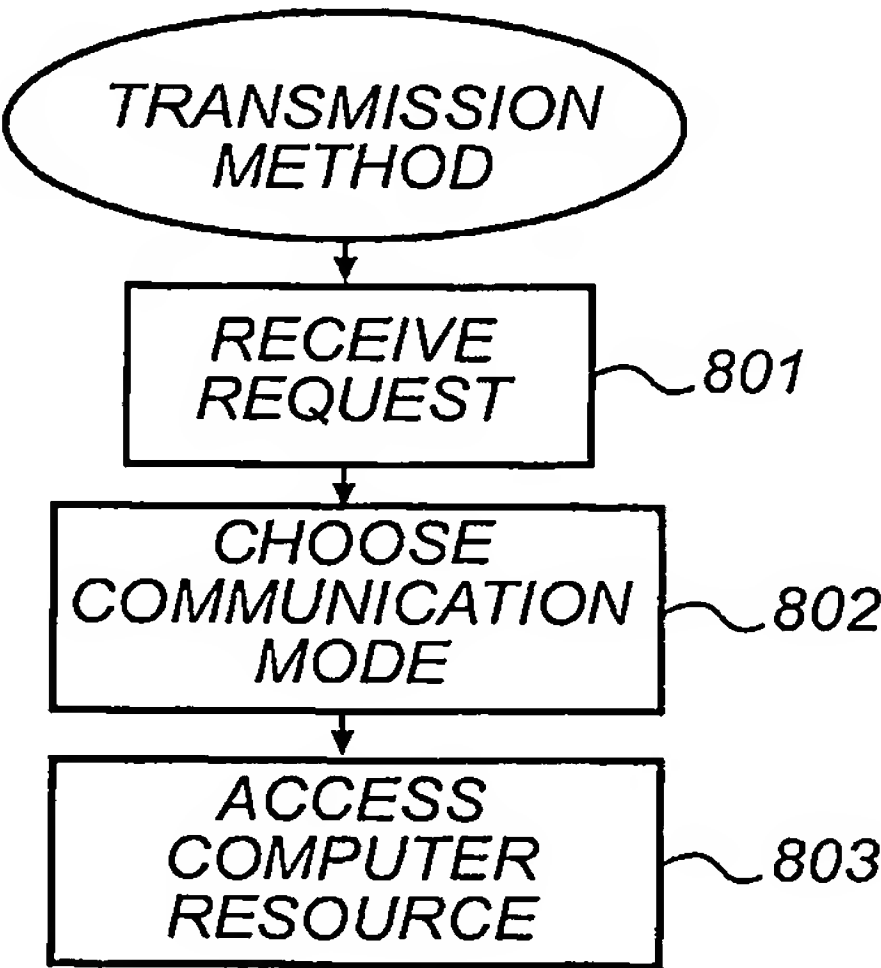**Fig. 8**

INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 02/02391

A. CLASSIFICATION OF SUBJECT MATTER

IPC7: G06F 3/033, G06K 9/22, G06K 11/18

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7: G06F, G06K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-INTERNAL, WPI DATA

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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A	WO 0116691 A1 (ANOTO AB), 8 March 2001 (08.03.01), abstract	1-20
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[X] Further documents are listed in the continuation of Box C.   [X] See patent family annex.

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"A"	document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"E"	earlier application or patent but published on or after the international filing date	"X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
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"O"	document referring to an oral disclosure, use, exhibition or other means	
"P"	document published prior to the international filing date but later than the priority date claimed	"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
31 March 2003	0 1 -04- 2003
Name and mailing address of the ISA/	Authorized officer
Swedish Patent Office Box 5055, S-102 42 STOCKHOLM	Åsa Viken /LR
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INTERNATIONAL SEARCH REPORT

C (Continuation).   DOCUMENTS CONSIDERED TO BE RELEVANT

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Information on patent family members

		30/12/02	International application No. PCT/SE 02/02391

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